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ATTEMPTS AT ARTIFICIAL GOLD

By Dr. Edwin E. Slosson

For some three thousand years, off and on, chemists have been trying to make gold out of the baser metals. Just now they are on the quest again with as high hopes as the medieval alchemists and with better reason. We now know that some atoms can be broken to pieces and that some elements can be transmuted into others. The metal radium decomposes spontaneously into the gas helium and the metal lead. Professor Rutherford has split up the nitrogen atom into helium and hydrogen. The helium atom weighs 4 and they hydrogen atom weighs 1. The helium is supposed to be made by the combination of 4 hydrogen atoms.

Now if you subtract weight of the gold atom (197) from the weight of the mercury atom (201) you get 4. So it would seem that if you could knock out from the mercury atom a helium atom, or its equivalent 4 hydrogen atoms, you would get gold.

But can you? That is the question. This may be, like many another chemical reaction, easy to write out on paper yet impossible to accomplish in the laboratory. But two chemists, a German and a Japanese, say that they have done it.

Prof. A. Miethe of the Photochemical Department of the Berlin Technical High School, who has been for years studying the discoloration of minerals and glass by ultra-violet light, found that the mercury vapor lamps used as a source for these rays ceased after a time to work, owing to the deposit of a sort of soot on the quartz glass wall. He tested this deposit and got indications of gold.

Now it is not surprising to find a trace of gold in commercial samples of mercury, for mercury is one of the few liquids that will dissolve gold and is used to extract the precious metal from sand or ores. But the mercury in the lamps had been twice distilled to free it from all impurities and on analysis showed notrace of gold until after it had been subjected to the prolonged action of the electric current in the lamp. The quartz, the iron and the carbons of the lamp were also analyzed and pronounced gold-free. Miethe sent samples of these and of the mercury, before and after using in the lamp, to Professor Haber, the inventor of the Haber process for fixing nitrogen, who has been interested in the extraction of gold from sea water and had developed a very delicate method of estimating gold in minute amount. He reported finding gold and in some cases silver in the samples that came from the lamps. The amount varied from one to fifty-two parts in a billion parts of mercury.

From these experiments, which Miethe has carried on with his assistant, Dr. H. Stammreich, since last April, he conclues that some of the atoms of the mercury have been crumbled away by the electric current passing through the vapor, leaving gold as a residue. In his lamps he used 170 volts between the electrodes and ran currents from 400 to 2000 watts for periods of 20 to 200 hours.

From the other side of the world comes the report of similar success in the manufacture of gold artificially. Professor Hantaro Nagaoka of the Tokyo Imperial University has published a phtograph of a deposit of gold which he obtained by running a mercury lamp for more than 200 hours under a voltage of 226. The gold obtained amounted to a milligram and a white metal that appears to be platinum was also produced.

In the United States Prof. H. H. Sheldon of New York University is engaged in repeating these experiments and doubtless many others are quietly carrying on the quest.

But there is as yet no apparent reason for the alarm that synthetic gold will upset the standard of the world's currency. The process, if possible, is too expensive to be profitable. Although gold is more than three hundred times as costly as mercury yet the electric current would cost more than the value of the gold produced. This is likely to remain true however much the efficiency of the apparatus is improved. Professor Miethe expressly warns the public that his discovery of the possibility of decompsing the mercury atom has no commercial importance and that speculation in this direction is rash and premature. There is no ground for the suspicion that the Germans are secretly manufacturing gold with intent to pay off all their war debts before the rest of the world learns how. If the aim is to produce wealth it would be much more profitable to find out how to get energy out of the atom than how to transformthe elements by putting energy into the atom.

"A" STOOD FOR "BISON" IN OLD MESOPOTAMIA

The image on the American five-cent piece, the letter "A", and the great winged bulls of the palaces of Babylon, are all pictures of the same animal. This is the discovery of Prof. Max Hilzheimer, director of the natural history section of the Provincial Museum of Brandenburg in Berlin, who has made a special study of the ancient images and inscriptions in connection with the former distribution of the European bison.

This little-known animal, known in Germany as the Wisent and in Russia as the Zubr, is now even nearer extinction than its American cousin, but once had a much wider range, roaming the plains of Mesopotamia when that country was the world's "Wild West". That it was important to the early inhabitants of western Asia is shown by its appearance on many cylinder seals and other inscriptions of the old Sumerian civilization, whence it was adopted by the later Babylonians and Assyrians, even though the animal itself had by then disappeared from the country.

These early peoples used a picture - writing built on somewhat the same principles as modern Chinese. The Assyrian character for "bull" was a triangle standing on its point, representing the broad face of the animal, with a pair of short horns projecting. Something very like this character can be obtained by turning a capital " A" upside down. The early Hebrew word for "bull" was "alpha", expressed with the old Assyrian word-sign. Later the same sign, inverted, became the Hebrew-Phenecian "aleph", the Greek "alpha", and the Latin-Modern " A".

Early Sumerian figures of this ancient bison show it standing erect and fighting with beasts of prey, with men, even with the gods. The broad noses of the animals, with their suggestion of a Semitic shape, together with their characteristic beards, must have made them seem very man-like to the old Mesopotamian peoples and their gradual conventionalization into the winged, humanfaced, bearded colossi of the ancient palaces and temples was a natural change.

NEW-FOUND DIET FACTOR PREVENTS PELLAGRA

Pellagra, a disease of serious importance in the South, may be prevented by the newly discovered "dietary factor P-P", present in brewers' yeast, fresh milk, and fresh beef. While it may be a vitamin, it is not identical with any of the vitamins hitherto discovered and described. Drs. Joseph Goldberger and W. F. Tanner, of the U. S. Public Health Service, discovered this new disease-preventing factor while they were at work at the Georgia State Sanitarium for colored women, where many of the immates were sufferers from pellagra.

Earlier investigators had made frequent statements that peas and beans were pellagra preventives, but Drs. Goldberger and Tanner found that even when the patients were given these foods daily in considerable amounts, pellagra still developed. Then they tried fresh milk casein in the form of cottage cheese, and got good results. Dried milk powder, however, failed to have the same preventive power. The best results were obtained with brewer's yeast. Patients receiving daily doses improved more rapidly than those on any other treatment tried.

By comparison of the diets of their patients with those used in treatments and experiments on other deficienty diseases, Drs. Goldberger and Tanner were led to the conclusion that none of the known vitamins or dietary factors could account in every case for their results, and that therefore there must be a hitherto unsuspected preventive factor at work.

PARATHYROID EXTRACT CURES SICKNESS CAUSED BY LACK

Successful treatment of parathyroid tetany, a deficienty disease caused by defects in the parathyroid gland, is announced as the result of researches by Dr. J. B. Collip of the University of Alberta.

The parathyroid gland is an obscure body associated with the thyroid gland in the throat, in the region of the "Adam's apple". It is one of the ductless glands, whose secretions pass directly into the blood, and are therefore very hard to isolate and study. Persons with parathyroid deficiency, and animals from which these glands have been removed surgically, develop a condition known as "tetany", marked by extreme nervousness, spasms and stiffening of the muscles, and other distressing symptoms.

Hitherto there has been no effective treatment for this condition, but Dr. Collip has succeeded in obtaining an extract from animal parathyroids, which he calls "parathyrin", and which seems to be the long-sought remedy. After a number of successful preliminary experiments with dogs, whose parathyoids had been operated upon, he tried the extract on a baby in a hospital, whose condition had become